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The Artistic Aspects of Trees.—V.

THE knowledge we need to gain, if we are to utilize to the best advantage such opportunities for planting as present themselves to us, is not a mere knowledge of the various forms and colors and textures that we may find in trees—it is a knowledge of trees themselves. Each species, each variety, presents itself to us as a whole made up of three blended elements, and it is the whole as such with which we should strive to familiarize ourselves. We must learn, not which tints or shapes in the abstract harmonize with others, but which trees are, from the point of view of beauty, fitting to associate with others. We must learn how each one looks in all the stages of its growth, at various seasons of the year, and under differing conditions of light and shade, of nearness and remoteness. If a certain tree seems out of place, we must be able to say not merely why we think so, but what other tree might better have been chosen. And when a spot is to be planted, we must be able to picture to ourselves how it should be filled, not in vague harmonies of abstract hues and shapes, but in definite mental portraits of actual trees.

Too often a much lower degree of knowledge than this is thought all-sufficient. Too often it is supposed that when one can recognize the trees he most commonly meets and call them by name, he really knows them. But he does not unless he can see them, so to speak, when he does not see them—unless he can recall the elements which make up their individuality and appreciate vividly their special qualities. We all can recognize our friends when we meet them. But something more than such knowledge as this is needed by the painter when he wants to compose a picture of many figures or to draw a face which shall have a given expression; and something more by the connoisseur, if he is properly to estimate and thoroughly to enjoy the artist's work. And as the painter and the connoisseur study and assimilate all they see, so too should the landscape gardener, and, no less, the lover of nature, if he wants to understand and enjoy to the full all that is offered him either in the unassisted work of nature, or in that which nature and the landscape-gardener have produced in partnership.

To study art as a preparation for the study and appreciation of Nature may seem, at first thought, a reversal of the right order of things. But it is in reality a wise course. If an artist were never anything more than a mere recorder of natural facts, a mere reporter in prosaic speech of things actually seen in this spot or that, his results would still be of service, enlarging our field of observation by the addition of his field and preserving for constant examination effects which are transitory in nature. But a true artist is something much more than this. He has at his command the power to preserve general truth of effect, and yet accentuate certain special truths more forcibly than, to our eyes, Nature has presented them. This power of interpretation in one man's work makes this thing more plain than Nature made it; in another man's it makes another thing more plain, and in the combined work of all makes Nature, as a whole, more plain, more vivid, more impressive. No matter how carefully and patiently we may study Nature in herself, we do not appreciate her to the full until we know what the great artists of the world have seen in her—how her forms, her textures, her colors, have appeared to eyes, tastes and feelings which by birth are clearer and keener than those of the average man, and by incessant training have been developed to a still higher degree of power.

In the study of form especially familiarity with landscape painting is of infinite value. Colors are so transmuted on canvas, and their variability from hour to hour in Nature is so different from their permanence in a picture, that to know what they really mean in Nature we must study them there. But forms are less variable in themselves, and are transferred to canvas with less intermixture of human personalities; and in no way can taste be so readily cultivated with regard to them as by a study of good landscape painting. Here it is that the painter's poetic power comes to help us—the power of idealization—of seizing this or that idea of Nature and expressing it more perfectly than, in this warring world, she herself is often able to express it. Colors so beautiful as those we find every day in Nature we seldom see approached in paint; but forms more perfect than those we are apt to see alive we constantly see on canvas. This is true even of the pictures of to-day, when of all artistic qualities form is the least highly valued; and it is even truer of the pictures of elder generations. The great classic masters of landscape—Claude, for instance, and Poussin and Ruysdael—are most valuable to the student of form in Nature; and, fortunately, their works can be as profitably consulted from this point of view in engraved productions as in their actual presence. Of course, it is not as text-books that they can be consulted, but as stimulants, as cultivators of the taste, as teachers of the great lesson, what is meant by beautiful forms, by satisfactory association of textures, by strong or graceful contours, by effective or subtile contrasts of light and shadow, by variety in unity, by diversity in harmony, by breadth, simplicity, repose and charm. These things they teach—not just what or how to plant in any possible given case; but these things we must learn in advance of any planting if we are to make a work of art of the result.

It is stated in the New Hampshire papers that preparations have been made to cut 6,000,000 feet of Spruce lumber this winter from the forests which lie about the base and cover the lower slopes of Mount Washington, the most important and the most frequently visited of the New England mountains. Six million feet of lumber is not a very large amount. It might be cut, if proper care was taken in doing it, out of the White Mountain forests without inflicting upon them any serious injury, and without in any way impairing the value of the White Mountain region as a reservoir of moisture, or as an agreeable and health-giving summer-resort. But care never is taken, or only very rarely, in American wood-cutting operations, and it is a foregone conclusion that in this case it will be

followed by disastrous fires, which will render useless what is now of great value.

The great reservoir of New England lies in the forests which cover the White Mountains and the elevated regions which surround them. This is also one of the most valuable and most generally frequented summer sanitariums in the United States. Its forests make it valuable. When they are gone its value as a natural reservoir is destroyed, and its value, with its beauty, to summer visitors and summer travelers, will disappear. These forests are the property of individuals, and no one can deny their right to cut them off if they think it is for their advantage to do so. Opinions may differ whether it is for the advantage of forest-owners to manage forests in such a way that three-fourths of their property is allowed to go to hopeless waste; but there can be no doubt—no question, that it is for the interest of the public that the White Mountain forests should be perpetuated in all their beauty and usefulness. The best investment the State of New Hampshire can make would be to buy up all this forest-region and hold it perpetually as a forest-reservation. The money it would cost would come back many times over in abundant water supply, and in the yearly disbursements of thousands of visitors from beyond the borders of the state. The railroads, too, which carry White Mountain visitors, and the owners of the hotels who feed and keep them, might do worse than secure control of this whole region and manage it with the view of making it perpetually attractive, which would mean perpetual preservation of the forests.

Whether, however, this region is purchased by the State of New Hampshire, or by a corporation holding it as an investment to be managed with a view of drawing from it the largest possible returns consistent with stability, it is certain that unless one of these plans, or some other, looking to the permanent safety of the forests, can be adopted, this region and its usefulness will be ruined.

Monsieur Buser, the custodian of the Candolean herbarium, has just published a supplementary volume to Bossier's "*Flora Orientalis*," containing the results of the latest investigations made upon the plants of the vast region covered by the work of the famous Swiss botanist, who died in 1885. A most interesting and appreciative notice of Bossier's life and of his contributions to science, from the pen of his compatriot, Dr. H. Christ, precedes the strictly botanical portion of the volume, which is further enriched by a portrait of Bossier. There are views, too, of the bust of Bossier erected in the Botanic Garden in Geneva by his sister, the Countess Agénor de Gasparin, and of the building containing his herbarium, one of the largest and most valuable in Europe, now the property of the city of Geneva.

The name of Bossier, one of the most distinguished of the group of systematic botanists who have produced Floras of great natural regions, will not soon disappear from the annals of horticulture. It was Bossier who discovered, during his first Spanish journey—afterwards described in one of the most delightful books of botanical travel—upon the summit of the Sierra Bermiga, near Estepena, the beautiful Spanish Fir (*Abies Pinsapo*), which he introduced into cultivation the same year; and among humbler plants for which our gardens are indebted to his zeal it is only necessary to mention the lovely *Chionodoxa Luciliæ*, which he discovered among the melting snows on the alpine summits of the western Tmolin, above Bozdagh, in Asia Minor, and which he dedicated to his wife, the companion of some of his early journeys. Bossier was a most successful cultivator of alpine plants, and his rock-garden, which he established as early as 1852, at his country place of Valeyres, at the foot of the Jura, must have been one of the most interesting ever made. The journeys of his later years (and the number was astonishing, in view of the vast amount of literary and herbarium work which he accomplished) were undertaken for the purpose of securing rare plants for his garden for which he laid under contribution all collectors and all countries, and the plants others could not find, he went in search of himself. Here were mingled plants from the Rocky Mountains to the Himalayas, including those from every mountain chain of southern Europe and of the Orient, which no one has ever known, botanically, so well as Bossier. He cultivated, too, a large collection of exotic Orchids at his winter-home on the shores of the lake, near Geneva.

An appropriation of $100,000, to enable the United States Geological Survey to begin an investigation into the practicability of inaugurating a national system of irrigation, by which it is hoped that immense tracts of lands in the Western States and Territories, now barren and worthless, can be made available for agriculture, was included in the Sundry Civil Appropriation Bill passed at the last session of Congress. Major Powell has estimated that the territory which can be reclaimed for agriculture by irrigation is equal in extent to the whole area now cultivated in the United States. It is impossible to determine, of course, whether his estimate is correct or not, but it is safe to say, with all due allowances for over-confidence in the possibilities of irrigation, as applied in western North America, that this new enterprise of the government is one of the most important, if not the most important, it has ever undertaken, and that eventually the national wealth must be increased by it enormously. Homes will be created for millions of industrious and prosperous families, and the natural products of the country will be increased enormously, it is safe to say. This appropriation, to which not a dozen members of Congress, probably, ever devoted a moment's consideration, seems destined to mark a new era in the prosperity of the nation.

The Pines in Mid-November.

THE foliage has mostly disappeared from deciduous trees and shrubs, but many herbaceous plants are wonderfully preserved. They escaped the light frosts of October, and the unusual warmth of November has endowed them with fresh vigor, so that in chosen spots among the Pines we still find many beautiful flowers. Some of the Asters, and even Golden-rods, are blooming still. But one of the most delightful surprises is a bed of blue Violets—a form of *Viola cucullata*. Not even in the spring-time have I ever found plants blooming more profusely than these. The flowers are large and bright blue, and, together with their leaves, make charming bouquets. But the most attractive novelty is a little patch of the violet Wood Sorrel (*Oxalis violacea*) in full bloom. It is under an old Pine tree; and standing well up above the dry needles which carpet the ground are a good many pretty flower-scapes, with several bright blossoms on each, but not a leaf has made its appearance. I shall keep watch of the future behavior of these plants. Next spring they will show probably nothing but leaves.

Another handsome flower is the Soapwort Gentian (*Gentiana Saponaria*), with half-closed corollas, but bright and beautiful with its smooth, deep green leaves, some of them inclining to a purplish tint. And near by is its small relative, *Bartonia tenella*, still in bloom. This little plant has small, inconspicuous white flowers, but in the middle of November the most insignificant flower that braves the weather commands our admiration for its sturdy character. I also find fair specimens of *Polygala lutea* in flower, and a species of Xyris.

The foliage that still clings to many trees and shrubs, which seem half inclined to be evergreen, is an interesting study. The leaves of the Swamp Magnolias, especially the younger ones, are as bright and shining as in midsummer, and those of the smooth Alder (*Alnus serrulata*) and Sweet Fern are still abundant, fresh and green. The leaves of the Wax Myrtle (*Myrica cerifera*) are now deliciously fragrant, and show no signs of loosening their hold. Indeed, like the Sweet Fern in sheltered spots, the shrub is nearly or quite evergreen, and holds its foliage well into spring.

In all my pleasant autumn rambles I have found nothing more beautiful than the running Swamp Blackberry (*Rubus hispidus*). Its delicate tracery of stem and leaf are laid over a bed of damp green moss. The foliage is charmingly colored in crimson, scarlet and purple.

The slender stems or long runners are quite free from prickles, and wind around among beautiful clumps of the Pitcher-plant, which are also gorgeously colored with crimson and purple veins. The bright cups of the Pitcher-plant are so flower-like, that they lure many insects into their depths, from which there is no escape. Two or three species of Lycopodium wind in and out among the moss, now hidden entirely from sight and again reappearing to throw up fertile spikes from a few inches to more than a foot in height. Standing a little in the background is the narrow-leaved Cat-tail (*Typha angustifolia*), which adds a special grace to the whole picture. This species is more rare and delicate than the common Cat-tail (*T. latifolia*), which grows in stagnant ponds and swamps throughout the United States. There is as much difference between these two Cat-tail flags as between the large Blue flag (*Iris versicolor*) and the slender Blue flag (*I. Virginica*), both of which grow near by.

The Groundsel-tree (*Baccharis halimifolia*) is now conspicuous with its long, white, silky pappus. Although it belongs to the largest order of flowering plants, it is the only one in this vast order, in our temperate climates, that attains the dignity of treehood. In the Pines it grows from ten to fifteen feet in height, and in autumn is a very marked feature in the landscape. The copious pure white pappus with which the fertile plants are enshrouded, at a little distance look like a mass of white flowers, strangely out of season in their rich setting of autumn foliage.

Two or three species of Dodder are now brought into view as the leaves of their supporters have withered or fallen. *Cuscuta glomerata* is the most notable, as its knotted cords strangle and sap the life of its foster plants until they are dwarfed, prematurely fade, and finally die. This species usually attacks the Compositæ, and sometimes other herbaceous plants. It starts from the ground like any respectable plant, and for awhile is self-supporting, and is quite attractive in appearance, with its bright orange stems. But it soon attaches itself close to some other herb, gives up its hold upon the earth, and relies entirely upon its host for support. Another species (*C. tenuiflora*) attaches itself to the shrubs among the Pines. This species has the appearance of twining more loosely than the former, and climbs higher on its foster plant.

Attractive plants are still found in the more exposed places on dry sandy soil. Among them is the smaller Pinweed (*Lechea minor*), a pretty little Heath-like plant growing in masses, but each plant is worth examining by itself, as its small single stem spreads out into numerous branches, giving it the appearance of a miniature tree. The branches and foliage form a dense mass a foot or more across the top, and the foliage has now taken on a purplish hue, making it very pretty and effective. These little tree-like plants are less than a foot in height, and grow in the most unpromising soil.

Hudsonia tomentosa is another little bushy Heath-like shrub about a foot in height, and covered with small persistent grayish leaves, giving the plant a hoary look. This, too, grows in the sand, even when it is so loose as to drift before the wind. Very often considerable patches of the plant are covered up in this way, and remain so until the wind from another direction blows the sand away.

Vineland, N. J., November 17th. *Mary Treat.*

The source of the superiority of good landscape gardening lies in the artist's removing from the scene of his operations whatever is hostile to its effect or unsuited to its character; and, by adding only such circumstances as accord with the general expression of the scene, awakening emotions more full, more simple and more harmonious.—*Uvedale Price, 1796.*

To range the shrubs and small trees so that they may mutually set off the beauties and conceal the blemishes of each other; to aim at no effects which depend on nicety for their effects, and which the soil, the exposure, or the season of the day may destroy; to attend more to the groups than to the individuals; and to consider the whole as a plantation, not as a collection of plants, are the best general rules which can be given concerning them.—*Thomas Whately, 1770.*

It cannot be too strongly insisted upon that Nature is to be followed, not spoilt at the expense of labor and ill-employed wealth, not strangely and violently disfigured in the effort to embellish. All gardens cannot be planned after some one pleasing model. The special character of the ground must be regarded. By attending to this we shall be more faithful to Nature, and a greater number of gardens will be beautiful without being servile copies.—*W. S. Gilpin, 1832.*

Foreign Correspondence.

London Letter.

POTATO disease has been exceptionally virulent in England this year. Few kinds have escaped, many have suffered very severely, while in some districts the crop has been almost totally destroyed. We are no nearer a disease-proof Potato than we ever were, and as the wild tubers are said to be affected by it, there seems little hope in that direction. But the simple plan recommended by Professor Jensen, of Copenhagen, which is nothing more than high earthing in autumn, appears likely to prove a palliative at least. This has been shown recently by some experiments made at Chiswick, and which have been watched and reported upon by Dr. M. T. Masters. In August a portion of a plot of the variety Schoolmaster was high moulded, and another portion treated in the ordinary way. They were lifted on September 29th and carefully examined, the result being, that of those moulded in the ordinary way twenty-six per cent. were diseased, and that only ten per cent. of those moulded high, in accordance with what is known as the Jensenian treatment, were affected.

Orchids in November are either asleep or preparing for their spring display. Of course, there are Cypripediums and a few odds and ends besides, but, at this time of year, Orchid-houses are dull. Of new kinds, we have two forms of the richly colored *Cattleya aurea*, which are named *C. Massaiana* and *C. chrysotoxa*. The former is a supposed natural hybrid, *C. Gigas* being the other parent. The sepals and petals are rosy-lilac, the lips being large, crimson, with golden reticulations and two eye-like blotches of yellow. *C. chrysotoxa* is a very robust and large-flowered form of *C. aurea*, with the colors clear and rich in tint. Both kinds are Sander's introductions. *Lælia Perrini*, var. *alba*, is a form with flowers wholly snow-white, without any purple or yellow markings on the labellum. The leaves of the variety are larger and broader than in the type. It was introduced by Mr. Sander, and is now in the famous collection of Mr. R. H. Measures, Streatham.

The fortnightly meeting of the Royal Horticultural Society, held on the 14th instant, was devoted almost entirely to talk about the affairs and future of the society. Very few plants were exhibited, and of these only the following were noteworthy: (1) Malayan Rhododendrons.—The extraordinary success attained by the Messrs. Veitch in hybridizing and cross-breeding among plants of all kinds is very well attested by the marked improvement made in the habit, colors and variety of this section of Rhododendron. From two or three comparatively poor flowered species, obtained from Java and the Malay regions, at least a score of beautiful hybrids have been raised by the famous Chelsea firm, and all in the course of half a dozen years. Flowers of a dozen of the best sorts were sent to the meeting last Tuesday, amongst them being white, pink, crimson, nankeen, canary and salmon colors. These plants are easily grown, they flower freely, and the blooms last a month or more. (2) *Lælia Victoria*, a hybrid raised by the Messrs. Veitch from *L. crispa* and *L. Dominiana*. It resembles the former in most points, differing chiefly in the form and color of the labellum, which is oblong and spreading in front, undulated, and colored rich maroon-purple. I have seen forms of Crispa almost as good. It obtained a first-class certificate. (3) Chrysanthemums Mrs. Garner and Avalanche, which were certificated. They are both Japanese, the former very full, five inches across, rather flat, the petals narrow, and colored deep yellow, tinged with bronze; the other is also large, globose, very broad in petal, and of the purest white. They were from Mr. G. Stevens, of Putney. (4) Flowers of Nymphæas sent from Kew, where these plants are well represented and successfully grown. Those shown were all forms of the gigantic *N. Lotus*, the best of them being the seedling named Kewensis. The new tuber, *Stachys tuberifera*, was also certificated. At present it has little to recommend it, but it may be developed into a useful vegetable. The potato had not much to recommend it when it first came to England.

Kew has the following plants of interest in flower: (1) *Kennedya Marryattæ*.—If your readers are not acquainted with this plant, permit me to recommend it strongly as a first-rate green-house climber. Planted in a bed of rich loamy soil, it grows very rapidly, soon covering a large space with its long, graceful branches. For training over pillars and rafters it is invaluable. The younger branches are pendent, a yard or more long, the leaves trifoliate, each leaflet ovate and two inches long, and the whole plant is covered with soft, silky hairs. The flowers are in short axillary corymbs, on stalks an inch long, each bearing four flowers, something like Sweet

Peas, and of the brightest scarlet color. Like all the Kennedyas, it is Australian. The Kew plant has been known to flower profusely for at least six months at a stretch. (2) *Hibbertia dentata*, which is another green-house climber of great attraction. It has oblong leaves about three inches in length and colored deep chocolate; the flowers are large, single and golden yellow. During winter this plant makes a pretty display. (3) *Senecio Ghiesbreghtii*, which is used here sometimes for out-door bedding in summer, but it is of greater value as a flowering plant for large conservatories in winter. The stem is stout and from six to ten feet high, with large ovate leaves a foot long, and enormous terminal corymbs of deep yellow flowers. It is planted in the beds in the Kew conservatories, and is in grand condition now. No doubt you cultivate this plant in your gardens, as it is Mexican, but it may not be utilized with you as a winter-flowering subject. (4) *Dahlia imperialis*, which is another giant composite from Mexico. In the gardens bordering the Mediterranean it attains magnificent dimensions, and at Kew it grows to a great size. The largest plants are twelve feet high, with a stout single stem, clothed with very large decompound leaves, those at the base of the stem being about a yard through. The flowers are in large spreading panicles, very numerous on well-grown plants, and each one is six inches across, somewhat cupped, the single row of petals broad at the base and gradually narrowed to a long point; they are white, with a faint tinge of purple, the small cluster of disc-florets being yellow. As this plant blooms in November and December, it is valuable for the decoration of large houses. At Kew it is started early in spring in a little warmth, and then placed outside when the weather is warm enough. It requires a little heat in October and November to bring the flowers to perfection. (5) *Befaria glauca*, which is an interesting green-house shrub, introduced to Kew a year or two ago from the Andes of Peru. It flowered for the first time last year, and a plant of it is again in bloom. The habit is that of a Rhododendron, the leaves are about two inches long, glaucous beneath, and the flowers are in terminal spikes. The plant is only three feet high, with one stem, but this bears a cluster of seven erect spikes, each nine inches long, and bearing a score of flowers, which are bell-shaped, one inch across, and rose-colored. This plant is known here as the Andean Rhododendron. It is Ericaceous and evergreen.

Out-of-doors there is, of course, a scarcity of flowers, but we have three little attractions which deserve mention. They are: first, the autumn-flowering species of Crocus. The Kew collection of Croci is exceptionally rich, and they are arranged in two groups, the one autumn- and the other spring-flowering. Until only a year or so ago the autumn Croci were unknown in English horticulture here, but, thanks mainly to Kew, they are rapidly appearing in all good gardens. Of course, the display in the autumn depends very much on the nature of the weather, and in November it is seldom favorable to flowers. Lately, however, mildness, with a little sunshine now and then, have favored us, and consequently these Croci are good just now. Amongst them are white, lilac, mauve, purple, blue, and variegated. Altogether there are about thirty species of Crocus which flower between August and December, the first to appear being the pretty *C. Scharojani* of the brightest orange color. The cultural requirements of the species which bloom in autumn are exactly those of the better known spring-flowering kinds. The winter Daffodil (*Sternbergia lutea*) is another pretty and easily grown hardy plant which flowers at this time of year. At Kew it is planted in borders and bogs, where it never fails to develop its large, bright yellow, Crocus-like blooms. Close to it, or growing mingled with it, is the crimson-flowered Winter Gladiolus (*Schizostylis coccinea*), and the combination is pretty in effect. I suppose every one knows the value of the Schizostylis as a winter-flowering plant for the green-house, but is not often seen in a border out-of-doors. At Kew it remains in bloom till December, unless the frost is very severe, or there is a long spell of heavy fogs. Is *Hippophae rhamnoides* used as a garden plant in America? Here it is native, and consequently not often met with in gardens. It is the Sea-Buckthorn of every-day people. Planted on the edge of the lake, so that its roots are constantly under water, this shrub is a great success at Kew, every branch being now weighed down with the enormous crop of bright yellow berries. It is easily grown, and flowers and fruits freely every year. Being dicœcious, however, one must be careful to get both sexes and plant them near each other, or no fruit will come. The berries have a strong styptic flavor similar to that of the Oleaster, to which the Sea-Buckthorn is closely related. *Cratægus Lelandi*, a form of the well-known Pyracantha, is a new addition to winter-berried hardy shrubs. It is useful as a pot plant, owing to its habit of fruiting freely when only a few inches high. Large specimens are now a gorgeous picture of the brightest orange scarlet, the berries crowding on the branches much more than I have ever seen the old Pyracantha do. Whether grown against a wall or as a specimen shrub on a lawn, it is a perfect success. We are indebted to the Messrs. Veitch for its introduction. *W. Watson.*

November 16th.

New or Little Known Plants.

Berberis Fremonti.*

THE Mahonia section of the genus *Berberis* is the exclusively prevalent one upon the western side of our continent, ranging from British Columbia to Central Mexico, and from the Pacific Ocean to the Rocky Mountains and the Gulf of Mexico, and is represented by half a dozen or more species within the limits of the United States. It presents also an exception to the general rule of resemblance of the eastern-Asiatic flora to our Atlantic-coast flora rather than to that of the Pacific, inasmuch as several species of this section are found in Japan, China and the north-eastern borders of India, and nowhere else in the Old World.

Mahonia differs from *Berberis* proper in the full development of all the leaves, and the consequent absence of spines (which in the common Barberry are abortive, primary leaves), and in the pinnation of the leaves, which consist of one or more pairs of leaflets upon a common petiole. This petiole is jointed at the base of each pair of leaflets. There are no differences of importance either in the flowers or fruit, and it is easily seen how the Barberry is simply a Mahonia with undeveloped foliage, the primary leaves being reduced to a cluster of spines, and the secondary pinnate leaves to the single terminal leaflet which is always jointed upon the very short petiole. The leaflets in Mahonia are always evergreen and spinosely dentate, usually rigid and glossy, and often strongly reticulate-veined. The berries are globular, or nearly so, and often blue or nearly black. The species most frequently met with in cultivation are the well-known "Oregon Grape," the *B. aquifolium* of the Pacific Coast, and *B. Japonica* from Japan. Several other species are doubtless as well worth cultivation.

Berberis Fremonti, the characters of which are well shown in Mr. Faxon's figure, is a shrub growing from five to fifteen feet high, found in the arid regions of the south-west from Texas to Arizona and Lower California. It is very peculiar in the character of its fruit, which at maturity becomes dry and inflated, inclosing six or eight seeds. What appears to be a form of this species, with comparatively broader, elliptical and less spiny leaves, occurs in central Texas, and was named by Mr. Buckley *B. Swaseyi*. Little is known respecting it. *S. W.*

Pentstemon rotundifolius.

OF this plant, which was figured and described in the issue of this journal for November 28th, Mr. Pringle writes:

In the autumn of 1886 was found hanging quite in the manner of rock-brakes, from thinnest seams of dry granitic cliffs (on their sides least exposed to the sun), among the dry mountain chains southward from Chihuahua, a most singular Pentstemon, of so much beauty that Dr. Gray, when naming it as above, desired that efforts be made to bring it into cultivation. Seeds were accordingly distributed to botanic gardens, but in consideration of the strange habitat of the plant, it was with slight hopes of success. The plant is evergreen, with short stems which branch freely; its leaves are broad, very thick and leathery, glaucous; its flowers tubular, scarlet.

On its dry wall of rock, through winter frosts and the long term of fierce heats and absolute drought, when it

*B. Fremonti, Torr., in Bot. Mex. Bound. Surv., 30.

would not seem possible for its roots to gather a particle of moisture, yet never dropping its leaves, this plant maintains an existence for many years, a remarkable example of adaptation to environment. When the rains begin, whether it be in March or not until August, it puts forth new branches and flowers, and continues to bloom while the atmosphere retains any considerable degree of humidity.

Nature's plan for disseminating and perpetuating the species amidst conditions so exceptional is also interesting. However pendant the stems, the dehiscing capsules are held upright by a bending of their pedicels; therefore a strong wind is required for the dislodgment of the seeds, a wind which will sweep them along the face of the cliffs, and haply plant one here and there in an open seam. It must be that all the seeds which fall upon the soil perish; for I have never seen a plant growing in soil about the dozen localities for this species repeatedly visited by me. Restricted in its habitat to so uncommon and austere conditions, the species is, as would be expected, extremely rare. I have not yet secured sufficient material to place it in my distributions of *Plantæ Mexicanæ*.

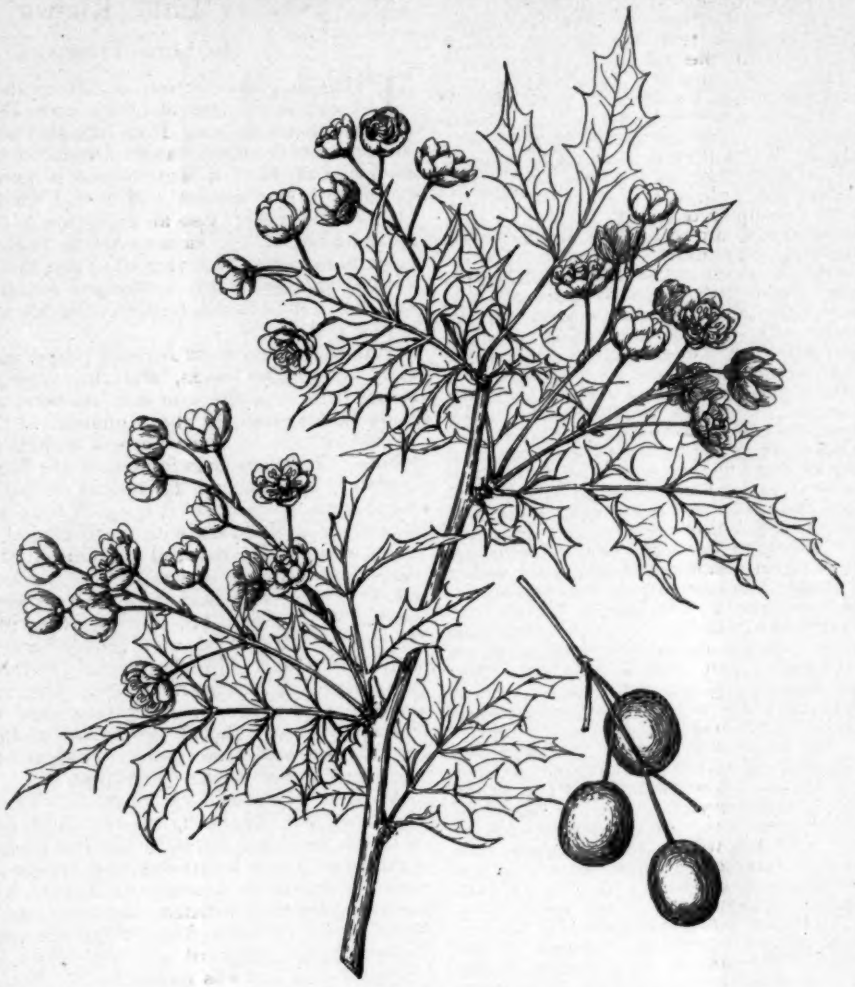

Fig. 77.—Berberis Fremonti.—See page 496.

Cultural Department.

Mushrooms.

A NUMBER of market gardeners on Long Island have for some years been growing Mushrooms for market, and many others are now building cellars for this purpose. Mr. Abram Van Sicklin is the pioneer in this business, and perhaps the largest grower on the Island. Not only has he large and commodious cellars devoted to the cultivation of Mushrooms, but he also grows them in his salad-houses in beds under the benches on which the Lettuces are grown. In these houses the beds are now made, and extend the whole length of the houses, often a hundred feet or more, and under the middle and side benches. But as the night temperature of 40° to 45° required for Lettuces now (last week of November) is too low for Mushrooms (55° to 60°), the surface of the beds is covered over with salt hay. The heat of the manure in the beds is sufficient to spread the spawn, and the hay saves the surface of the beds from the chill of a low atmospheric temperature. Mushrooms grow as well under a hay or straw covering as they do without it, but it is much more troublesome to gather them when covered. In Mr. Van Sicklin's cellar the beds are long and flat, arranged on the floor and on berth-like shelves above the floor-beds. He uses English brick-spawn, but has also used the French flake-spawn. He has made his own spawn, but, all things considered, believes it is cheaper and safer to use imported spawn, although the crop is uncertain at best.

Mr. Denton, of Aqueduct Station, is a successful grower of Mushrooms who has no greenhouses, but two large cellars. The one now being filled is some twenty-four feet square and about seven feet high, with a dry earthen floor. The beds are about four to five feet wide and arranged lengthwise on the floor, with narrow passages between them, and two shelf-like beds are fixed berth-fashion above each floor-bed, and at equal distances from one another. The bottom beds are floored and the shelves for beds are made and faced with rough hemlock boards. An iron stove and a line of sheet-iron smoke-pipe is used for heating the cellar.

The manure used is the ordinary stable manure from Brooklyn, which is hauled home on the return trips from market. This manure costs twenty-five cents a wagon-load in Brooklyn. After a pile of it has accumulated the most strawy portions are shaken out and the rest thrown into a pile in a large shed to ferment. Here it is turned as often as necessary to prevent burning; after it is in active ferment it requires turning every day till the violent heat subsides, which may be in three weeks after the manure was brought into the shed. Mr. Denton has better success with his beds made up of loam and manure than when manure alone is used. Therefore, when the manure is in good condition he adds about one-third of its bulk of common field loam, mixing all well together before making the beds. The beds, especially the shelf-beds, can be made firm more easily when this loam mixture is used, the manure alone being too springy to pack well. The facings, or sides of the beds, are one board, or ten inches wide, and therefore the compost can hardly be more than eight inches deep at first, if space is left for coating it over with loam after spawning. Mr. Denton finds most danger in allowing the manure to become too warm after the beds are put up; at the same time he likes good lively manure to begin with. When the temperature falls to 90° he spawns the beds. He uses both French and English spawn, and buys the imported article. While the English spawn may yield the largest Mushrooms, he thinks that those produced from the French spawn are, in proportion to their size, heavier and

more solid. In about six weeks after spawning he expects Mushrooms. A temperature of about 60° is maintained, but with an ordinary iron stove it is not an easy matter to keep up a steady temperature. And the stove heat, too, is apt to dry the earth on the surface of the beds, in which case they are freely sprinkled with water, but enough is not given to soak through to the manure.

While generally successful, Mr. Denton's crop varies a good deal in different years. Two years ago from these two cellars he gathered 2,200 pounds of Mushrooms, while last year his crop from the same space was less than 1,700 pounds. He is inclined to give a good deal of credit for the heaviest yield to the freshness and sweetness of his cellar that season, as he had it thoroughly cleaned out and limewashed in autumn before he made up his beds.

The one thing about Mr. Denton's arrangement that seemed faulty was the parching stove. A hot-air apparatus seems out of place wherever plants of any sort are grown, be they Mushrooms, Roses or Orchids. Besides, here is a big iron stove occupying a space which might be devoted to part of another floor bed and two whole shelf beds. A base-burner, hot water boiler and two three-inch hot water pipes run around inside the cellar, would seem preferable. The pipes could be run close alongside one of the shelves and would not be in the way at all, and any danger of their overheating the edge of the bed by which they were running could be averted by having a temporary board set alongside of them, making the shelf two boards high instead of one. No deep stock hole is required for these little boilers; they can be run on the common level of the cellar, and could be set into a niche in the wall four by six feet square. Two hods of coal a day will heat 300 feet of three-inch pipe. Surely this is better than any stove, and the first expense is the only one, for such an apparatus is simple and durable. We heat our Mushroom houses with this kind of boiler and hot water pipes, and nothing could do the work more effectively. *Wm. Falconer.*

Glen Cove, N. Y.

Fruits for Cold Climates.

IT must be set down as a rule that a fruit-tree should be of a variety that will endure all weathers in the place where it is planted. It must be hardy enough to stand the test winter; otherwise, just when the owner is looking for a first full crop, he may find only a dead tree.

Experience has proved that the fruit-trees of western Europe and their seedlings will not, as a rule, endure the winter climate of similar latitudes on the American Continent. All of Europe north of Rome is north of Boston. Boston is nearly the extreme north limit of the Peach, Plum, Quince and Apricot; and of the Apples and Pears of north-western Europe very few can be planted with profit more than 100 miles north of Boston. Seedlings from these do not, as a rule, show more resistance to cold than their parents. So seldom do they, that those of us who have had most experience at once suspect that such a seedling is an accidental cross with a hardier variety, like those of Russia and Siberia.

The Russian tree-fruits are undoubtedly of hybrid origin. Those of Poland and the Baltic provinces are much mixed and crossed with west European species. But, working eastward in the empire, less and less of this blood is found; and in the valley of the Volga and the Steppe region the influence of north Asia stock preponderates. It is from these trees that we get our most perfect "iron-clads" of all the tree-fruits.

Our north-eastern states and provinces require hardiness against cold alone; but in the Prairie States this is not enough. Intense summer heat and drought, and the fatal sap-blight, must also be encountered there; and trees for that region must thus be triply clad. The fruits of the Russian and Asiatic steppes furnish the best material to meet these contingencies.

As New England lies mostly on the latitudes of southern Europe, so Canada lies mostly on the latitudes of Russia and Siberia. Not only climate, but the length of seasons and of days, should be considered in estimating the value of fruit-trees. The winter Apples of Russia are many, but south of 45° they are only early winter or fall sorts. This lessens their value for our Northern States; but as they can be grown among our tender long-keepers, there is a fair probability that iron-clad crosses can be obtained that will prove long-keeping below latitude 45°.

Unquestionably many European trees are, in their seedlings, gradually adapting themselves to the American climate. The law of the survival of the fittest is all the time in operation, and interested parties are finding along the northern limits of our orchard region (and even within it) seedling varieties which show unusual resistance against cold. After trying several hundred of the hardiest Apples of southern Maine, New Hampshire, Vermont and Massachusetts in vain, and after coming to believe that there were no iron-clads among Massachusetts Apples, it was accidentally discovered (at the Centennial, I believe) that an Apple which I had received from Canada as the Strawberry of Montreal, is really the Foundling, which originated in Groton, Massachusetts.

Now that an interest has been aroused by the partial successes already attained, hardy seedlings are being sought out and tested all along our northern borders and in Canada. Scott's Winter is one of the Apples thus obtained, and though not an Apple of high quality or large size, it is a reliable keeper and a useful fruit, not only in itself, but as a beacon of hope for the future.

As for the Pears and stone fruits, the future is pretty secure, not only from the improvement of our native species of the last, but in the importation of the highly satisfactory Russian, Siberian and north Chinese varieties. I see no reason to doubt that, by discoveries already made, the orchard region on this continent can be extended from two to three degrees of latitude northward. That this is a wonderful gain, as the result of scarcely two decades of effort, is manifest; and there is more to come, for the work is scarcely begun.

Newport, Vermont. *T. H. Hoskins.*

Our Native Plums.

I HAVE made a specialty of Plums of the American and Chicasaw varieties for sixteen years, and since 1874 have never failed to have a crop of plums—even the unprecedented winters of '80 and '81, which killed the Peaches here, while buds were dormant, failed to kill the Wildgoose, Moreman, Miner, or Newman Plums. An ordinary crop is the exception; an enormous one the rule. This season on very light, sandy soil, my Wildgoose trees—twelve years planted—averaged six crates of thirty-two quarts each to the tree, which netted in Baltimore $1.60 a crate—the price ruled lower than usual because of the immense peach crop. With such experience a little enthusiasm may be pardonable. As a point of profit, there can be no comparison between these plums and varieties of the European species. With the latter, unceasing watchfulness and warfare against insects, at a time when labor of all kinds is pressing upon fruit-growers, is the price of a crop, while with varieties of the Chicasaw or American species, one longs for a more industrious breed of curculios to help in thinning out the crop. Among the most profitable varieties with me may be named Lone Star, Mariana, Wildgoose, Indian Chief, Newman, Quaker, De Soto, Robinson, Rollingstone, Golden Beauty, Moreman, and Wayland—named in the order of ripening. The number of varieties has increased rapidly within the last five years; such only are named as have had sufficient trial on my grounds to establish their value. The trees of the American varieties are more upright and much less scraggy in growth and habit than are those of Chicasaw parentage. As a rule, success with this class of Plums is rendered much more certain by alternating varieties in planting, because the stigma and stamens mature at different times in the blossoms.

As yet there seems to be no limit to the variations in seedlings, the Wildgoose being the parent of most of the varieties now cultivated. Six or eight years before his death Charles Downing suggested to me the possibility of obtaining a freestone Plum by crossing some of our native varieties with the Peach. Accordingly, I used the Wildgoose as the female and Troth's Early Peach the male parent in a trial to effect this end. The result was a real cross, so far as habit and appearance of the tree are concerned, but a genuine mule in point of reproductive powers; flower buds in abundance there have been, but they never expand. Since that I have approached a freestone variety pretty closely by using pollen from the German Prune upon the Richland Plum.

In my long study of native Plums, I have never found any evidence that the Mariana is a cross between the Chicasaw and some cultivated Cherry; neither do the facts in my experience lead me to believe that this alleged origin will bear the light of investigation. One fact alone seems to invalidate this claim: Neither the Wildgoose Plum nor the common Cherry can be successfully grown from cuttings, while the Mariana strikes almost as readily as a Willow. *J. W. Kerr.*

Denton, Maryland.

Orchid Notes.

Ærides Rohannianum is a choice Orchid, and much superior to any other of the Suavissimum section of the genus, to which it belongs. It is one of the recent introductions of Sander's, and is still somewhat rare. The racemes are some two feet long and densely flowered. The flowers are white, tipped with purple, the side lobes of the lip being citron yellow,

and the spur spotted with purple. The value of the flowers is enhanced by their delicious fragrance. The plant is a robust grower, and is doing extremely well with us in a wood cylinder, where abundance of water can be given the roots without danger of rotting them.

Trichosma suavis deserves a place in every collection, if only for its remarkable fragrance. But the flowers are very pretty, too; creamy white, with the side lobes of the lip striped with crimson, and borne on terminal racemes. The slender terete stems are about one foot high, surmounted by two broadly lanceolate leaves. This species is a native of the Khasia hills, evidently in situation where it has abundance of water, for in cultivation it can hardly get too much if the pots are kept well drained. A mixture of sandy peat and moss is a good compost for it, and a cool house is most suitable.

Vanda Sanderiana is now in flower with us. It is a magnificent Orchid, by far the handsomest of this large genus, and fortunately is now becoming more plentiful. In habit it resembles both *V. cærulea* and *V. suavis*. The flowers are borne on short, stout, axillary racemes, of a roundish outline and about four inches across. The color of the upper part is a delicate blush, while the lower is greenish-yellow streaked and suffused with crimson. The small concave lip is purplish-red. Being a native of the Philippine Isles, it requires strong heat, light and abundance of water during growth.

A close rival to the foregoing and belonging to the same section is *Vanda cærulea*, an older kind and much more plentiful. In this plant the racemes are longer and more loosely flowered, bearing twelve to twenty flowers; in color, lavender or light blue. This is a very unusual color among Orchids, and were this plant more easily grown it would become very popular; but, unfortunately, its cultural requirements are not generally well understood, and only rarely is it seen in really good condition for any length of time. It comes from the higher regions of the Khasia hills, and therefore requires comparatively cool treatment. It should also have plenty of light, abundance of water during growth, and a very long rest without shriveling the leaves.

Kenwood, New York. *F. Goldring.*

Autumn Flowers.—The United States should be the country par excellence for Michaelmas Daisies, but, perhaps, these pretty autumn flowers are not so much valued as in Europe. Among the numerous species and varieties of the old world, *Aster Ibericus* deserves all praise; it is a native of the Caucasus and very much resembles *A. Amellus*, but the flowers are much better in shape and outline, bright blue with a tinge of purple, all opening nearly at the same time, forming an even umbel of nearly a foot across; its height is about two feet and it flowers in September. *Colchicum speciosum*, var. *maximum*, is now very showy, its numerous, bright-purple flowers being fully five inches across. *C. autumnale albo pleno* is a gem among late-flowering bulbs; its perfectly double, well-shaped flowers appear in numbers and last at least three weeks. A clump of Snowdrops in full flower is an uncommon sight just now, yet *G. alanthus Olgæ Reginæ* has been blooming since the first of October, to be followed by *G. nivalis corcyrensis* during November and December.

Baden-Baden. *Max Leichtlin.*

Fig. 78.—Elæagnus longipes.

Plant Notes.

Elæagnus longipes.

MR. CHARLES WRIGHT, the botanist of the Wilkes expedition, detected this plant at Simoda in Japan more than thirty years ago, and its characters were first made known by Dr. Gray in his now famous and classical paper upon the Flora of Japan, read before the American Academy of Arts and Sciences in 1859.

Elæagnus longipes is a low shrub in cultivation, only a few feet in height, although it is said to become a small tree sometimes in Japan. The branches are unarmed or sometimes beset with spines, angular, and covered with small, rusty-brown scales. The leaves are somewhat coriaceous, oval-oblong, contracted into rather a blunt point, smooth and dark green above, and covered on the lower surface with a dense silvery white pubescence. The small

yellow flowers solitary, or more rarely two or three together, are borne on long slender peduncles. They are inconspicuous, but the fruit, which appears in our illustration upon page 499, is exceedingly ornamental. It ripens in July, and is oblong, half an inch or more long, bright red, and covered with minute white dots. This plant may well be grown for the beauty of its fruit alone, which, moreover, is juicy and edible, with a sharp, rather pungent, agreeable flavor. Both the size and the flavor can doubtless be improved by careful selection, and it is quite within the range of possibility that it may become a highly esteemed and popular dessert and culinary fruit. To some persons, even in its present state, the flavor is far preferable to that of the Currant or the Gooseberry. The plants are very productive, as our illustration shows, and they are easily raised and perfectly hardy. They possess, moreover, the merit of carrying their leaves bright and fresh well into winter.

C. S. S.

The Forest.

Forest Planting in Virginia.

At the recent annual meeting of the Pennsylvania Forestry Association, the President, Mr. Burnet Landreth, delivered an instructive address, from which we are permitted to make the following extracts. Other portions of the address will be published in subsequent issues of this journal:

In 1870 the senior member of my firm, who had been for a long life a collector and planter of trees for ornamental purposes, till he had established a noted collection, decided to plant a forest on a large area of old farm land in eastern Virginia, on the lower Chesapeake, where we held about 5,000 acres. The annual rainfall there is forty-nine inches; the relative humidity, both during summer and winter, seventy-three; the maximum temperature, 103°, the minimum, 1°, above zero. The wind in summer, south-west; in winter, from the north.

Of this tract, about two-thirds were in original and second growth Pine, with some hard wood interspersed. He decided to plant the open farm fields, and follow upon the stump-land, as the forest was cut off. Experience had made clear to us the wonderful reproductive capacity of the soil of tide-water Virginia, in reclothing itself with the natural Pine of that region—the Loblolly, or old Field Pine. Still we thought it might be profitable to establish forests of trees, both evergreen and deciduous, not common to that section, which would promise to be more profitable than the ordinary Virginia Pine. Among native deciduous trees found there were the Chestnut, Walnut, Ash, Oak and many others, not occurring, however, in forests of one variety, but always mixed. So we concluded to try the experiment of forest-planting which, if not profitable to us, might, at least, serve as a guide to others in that portion of Virginia. Accordingly, after preparation in 1870, in 1871 we planted 100 acres with the nuts of Black Walnut, depositing the nuts at one foot apart in open furrows drawn eight feet apart. We followed this by planting eight acres with Chestnuts.

The next year, 1872, we continued planting both seed and seedlings. Of seedlings, we set out 30,000 Black Locusts, 5,000 Southern Cypress and 5,000 European Larch. These we planted in solid blocks, four feet by four apart, intending that they should prune themselves.

In 1873 we planted four bushels of Locust seed, twelve of Chestnuts and one-eighth of a bushel of Larch seed.

In 1874 we put in 150 bushels of Black Walnuts, ten of Hickory Nuts (*Carya tomentosa*), twenty-two of Chestnuts, one of European Larch, ten of Catalpa (*C. bignonioides*), three of Poplar, three of Pecan, one of White Oak, and one-eighth of a bushel of Italian Sumac. Of seedlings, we set out 2,000 eastern Catalpas, 5,000 southern Catalpas, and 75,000 Black Locusts.

In 1877 we set out 10,000 Catalpas, 1,000 White Ash, 15,000 White Pine, 1,000 Douglas Fir (*Pseudotsuga Douglasii*).

In 1879 we set out 40,000 *Catalpa speciosa*, 1,000 *C. Kæmpferi*, 150,000 *C. bignonioides*, 10,000 Ailanthus, and 3,000 Douglas Spruce.

Since the last date, 1879, we have set out a large number of Catalpas and this winter shall have 100,000 seedlings to plant.

Now, the result of all this has been much disappointment, but not despair. We were first disappointed in the Black Locust plantations. The early groves had reached a height of twelve feet, the later ones, of course, being smaller. In the larger tracts the trunks were stocky, straight and limbless, the upper branches all interlaced, forming a solid roof, so that the midday sun seldom reached the alleys between the trees. They gave promise of a fine Locust forest, just such as we had pictured, but hardly expected to realize. But one September the Locust-tree Borer descended in swarms upon our groves, laying millions of eggs, which produced myriads of grubs, and by the next midsummer, every tree was ruined. We cut them down and pulled out the roots with oxen, the expenses of removal being twenty-five dollars per acre.

Next, the European Larch gave out in the trunk, the main stem breaking off at about twelve feet in height. This tree had never promised well, however. It thrives best upon dry, rocky soils; ours was a sand, with clay subsoil.

The Southern Cypress next failed, except in wet bottoms. Of Hickory and Pecan, the nuts planted were, to a large extent, stolen by the squirrels, woodchucks and field mice, and those that did vegetate made such slow growth that we plowed them out and replanted the ground with Catalpa. The Tulip Poplar was not a success, as the rabbits and field mice during winter ate off from the tender seedling the sweet, juicy bark, and destroyed nearly every plant. The White Oak acorns were largely stolen by animals, which also ate the bark of the young seedlings as they did that of the Poplar. The Italian Sumac, planted for its leaves, still stands, but the percentage of tannic acid in its foliage is not greater than in the leaves of the wild Virginia Sumac; and therefore its cultivation offers little hope of profit.

In short, with us, Black Locusts, Deciduous Cypress, European Larch, Hickory, Pecan, Tulip Poplar, White Oak, Osage Orange, Wild Black Cherry, Ailanthus, White Ash, Mulberry, and some others, have all failed.

Our successes have been principally in determining which varieties were not profitable to plant; and in this respect we have prospered famously. Our other successes, such as they are, have been achieved with four trees—Catalpa, Black Walnut, White Pine and Douglas Spruce.

Of the Catalpa we have abandoned several tracts, and, after most serious ravages by stray cows, half wild pigs, rabbits, squirrels, mice and fire, have about 200,000 trees, ranging in height from two to twenty feet, according to the period of planting. They stand in rows six feet apart, many of the rows a quarter of a mile long, and promise to make, in time, fine forest studies, if not eaten up, for the Catalpa, too, has its insect enemies. Two years ago every tree was denuded of its leaves, within a period of a month, by the ravages of the Catalpa Sphinx (*Daremma catalpæ*). These have gone, but they may come again and may stay. Still, this contingency of destruction by insects unavoidably attaches to the culture of any forest tree. Of the Catalpas there are two types cultivated for forest purposes, the eastern and the western, indicated botanically as *C. bignonioides* and *C. speciosa*, the latter being the most approved.

The tree is as hardy as a Chestnut, of quick growth, the trunk and limbs, by reason of its resistance to decay, being valuable as fence-posts, gate-posts and mud-sills. I have a piece of gate-post which stood in place 100 years, and it is in a perfect state of preservation.

The timber when sawed takes a fine polish, and is handsomely marked in its cellular structure. The Catalpa has been used in the West for railroad-ties, and possibly it makes serviceable ones; by some enthusiasts it has been extolled as superior to the White Oak, but that is folly. A first-class tie must have other merits than ability to resist decay from moisture. The catalpa tie is deficient in power to resist the hammering of the rail under passing trains, and it is deficient in that adhesive power upon railroad-spikes possessed by white oak or chestnut. In oak very careful tests have proven that as much as a pull of 4,000 pounds is required to draw out a spike driven five and a half inches. In catalpa the adhesive power is not one-half of 4,000 pounds.

The second deciduous tree which we have planted in large number is the Black Walnut. In tide-water Virginia it is found wild and of noble proportions. Our seedlings, however, have grown very slowly. For the first six or seven years they grow but a little more than four inches a year, and it is only when they become very deeply rooted that they appear to start off vigorously. The lowland soils, however, are not adapted to the development of the best Walnut timber, the wood produced there being too full of silex. It will not polish as smoothly as timber grown upon a soft prairie soil. It is stronger and better suited for

the legs and rounded portions of furniture, but, as a rule, does not furnish handsome paneling. Our Walnuts, of which we have 150,000 left, after as many have been destroyed and others abandoned, do not impress us as of much value, and for the present we shall plant no more.

Our attention was directed to the White Pine as flourishing upon our particular soil by a wild settlement of these trees in the midst of one of our Yellow Pine forests. Here we found a parent tree, ninety feet high, grown probably from a seed dropped by a bird of passage, possibly from far-off Maine. It has germinated, reached maturity and developed seed, which, falling around, has in turn germinated and developed seed-bearing trees, till now the growth of several generations of trees stand in concentric circles. This natural group clearly indicates that soil and climate were hospitable to the White Pine. The results of our own plantations, in addition to this example, make it quite evident that the White Pine can be grown successfully. The principal difficulty with plantations of this tree lies in securing a stand in the first instance, as a large percentage of the seedlings die.

The Douglas Fir I consider the best of the two evergreens. It grows as rapidly as the White Pine, and if it escapes the ills of forest life and reaches maturity, it will be more valuable. One of its merits is early maturity. Its long, tapering and light trunk particularly suits it for shipspars, while the older trees reach vast proportions and form a trunk far surpassing the White Pine of Maine. This tree for Eastern plantations should be grown from Colorado seed, as the Oregon variety is not so hardy.

I would recommend that the White Pine and the Douglas Fir be planted in alternate rows, so that in case of destruction of either variety by insect depredations or soil influences, there may be a chance for the remaining variety to reach maturity. Indeed, all plantations should be mixed for the same reason, but they must be mixed judiciously.

After eighteen years of practical forest-planting on a small scale, I conclude that for the particular region of tide-water Virginia—and I think I may venture to say as well for tide-water Delaware, Maryland and North Carolina—there are only four trees to plant; I conclude, also, that it is very questionable if it be profitable in that region to plant at all, so long as the Loblolly Pine will spring up in every field just as soon as annual cultivation ceases. How the seeds get there I cannot tell, but they will spring up in the centre of a one-hundred-acre field simultaneously with their appearance upon its tree-fringed borders.

This Pine will start without plowing, and it will grow under the most adverse circumstances. It will take care of itself in spite of wild hogs and stray cattle. Fire is its worst enemy. In twenty years it will make twenty cords of brickyard fuel, and for every year thereafter an additional cord or more, till at forty years it will cut fifty cords of first-class wood; the only expenses being the taxes, which altogether do not equal one-half of one per cent.

Correspondence.

Horticultural Exhibitions.

To the Editor of GARDEN AND FOREST:

Sir.—Whenever I attend horticultural exhibitions in different cities, the question comes to my mind: Are they managed properly? Do we use the material to the best advantage, not only from an educational, but from a financial point of view? I have before me a number of reports of horticultural societies. Turning to the lists of standing committees, I find the names of men who have made national reputations for themselves in the learned professions, in art, in science or in various branches of business. Turning to the list of exhibitors, I find many names equally famous. In both cases they are men of refined and cultivated tastes; men who have proved their ability by their success. Again, I turn to the treasurer's report, and, without going into details, it appears, as every one knows, that the exhibitions rarely prove financially successful.

What are the causes of this failure, and what are the remedies? There are plenty of standing committees. Possibly they have been standing too long. There are plenty of good pushing men on them who are successful in their own business. Why are they not successful here?

Is it because they are held back by some of the older members who cling to "the good, old methods"? If it is a lack of money, this, I believe, could be overcome by personal subscription, if the members could show the public any advanced ideas that would be beneficial. The wealthy gentlemen always seem very glad to do their part in contributing their specimen plants.

Allow me to suggest:

1. That the entire hall in which an exhibition is to be held be treated to a thorough cleaning.

2. That it be profusely decorated with Laurel wreaths, Laurel branches, evergreen trees and other greenery, from the entrance to the dome. In most cases I believe enough enthusiasm could be aroused among the members to contribute to this in the shape of labor, material or money.

3. That the tables, benches and staging, in every instance, be covered either with paint, moss or evergreens, instead of with bare, broken, rough and age-stained boards.

4. That in front of these tables, instead of allowing the trestles and horses to show or attempting to hide them with paper, I would suggest using some kind of cloth with eyelet holes fastened with screw-eyes, which could be used a number of years.

5. That proper vases be obtained in which to show cut flowers, and that these should be always kept clean, and particularly so if transparent.

6. That exhibitors of Grapes be requested to hang all Grapes, and that the amount of "bloom" be a strong point in judging, while those that have been carefully polished should be barred.

7. That if vegetables are to form a part of the exhibition, none but remarkable specimens be admitted.

8. That if enough social influence could be brought to bear, the first night be devoted to "Society," with lady patronesses and a banquet and bouquets for the patronesses only. I have no doubt but that the tickets or invitations could be disposed of at five dollars apiece. The day following should be open to all at fifty cents apiece. Every part of the house would have to be opened to accommodate the crowd.

9. That if "Society" could not be induced to participate (which is hardly probable, as there are so many fashionable people connected with horticultural societies), a number of influential ladies be induced to interest themselves as a Ladies' Committee.

10. That a little money be expended upon the local papers, which are always very kind, even to inferior shows. Make the exhibitions worth illustrating, and they will give you hundreds of dollars' worth of advertising.

11. That two orchestras be engaged to give promenade concerts at fixed hours and music at frequent intervals. Sometimes barely enough money is realized to pay a single band. Have enough music to pay for itself.

12. That all plants be named properly with both botanical and common names. Mark the *Peristeria elata* the Holy Ghost or Dove Plant; *Nepenthes*, the Pitcher Plant; *Platycerium Hilli*, the Stag-horn Fern. A little description of these flowers would attract a great deal of attention. A child can see the resemblance, and it would interest all, while heretofore they have been passed by almost unnoticed.

13. That exhibitors of cut flowers should be required to have them renewed or freshened up from time to time, and that all watering of plants should be done early.

14. That few complimentary tickets should be given out.

15. That all exhibits, and especially those of cut flowers and designs, should be judged by "points." If one plan could be adopted all over the country, judges from other states would be preferable.

16. That premiums should be liberal, and awarded with the greatest care.

17. That if at any time during the exhibition the attendance is not too large, complimentary tickets be sent to different schools interested in botany, which would prove valuable from an educational standpoint.

18. That the managing editors of the city papers should be notified of the efforts that are being made to make this the grandest display of plants and flowers ever offered by this society; that the "society" people of the city are taking a more active part than formerly, and that it is expected to be one of the social events of the season. That a committee of well-informed men be appointed to receive all reporters, not only to repay them in a slight way for their kindness, but to aid them in their work, that a technically correct report may be given of the exhibition.

19. That for a Chrysanthemum show the decoration should be most elaborate. Japanese vases, rugs, screens and lanterns would be very appropriate.

Philadelphia. *H. H. Battles.*

Pinus sylvestris.

To the Editor of GARDEN AND FOREST:

Sir.—There are several specimens of the Scotch Pine upon the college campus here, and in most instances they are making a good growth. During the three seasons before the present one the trees have borne cones in abundance. This was strikingly true for 1887, and this spring the trees were conspicuously loaded with the old cones. These same trees—and there are several of them close by—this spring produced an unusually large number of staminate blossoms, but an extended search failed to reveal any pistillate clusters. We have scores of Scotch Pine trees upon our ornamental grounds, and among them all only one has been found this season bearing cones of this year's growth, and upon that there were not over a dozen. The striking contrast between the thousands upon thousands of cones of last year, and the almost total absence of them this season, has led to this note, with the hope that some dendrologist may assign the cause. Is it a case of overbearing in 1887 and recuperation this season?

Byron D. Halsted.

Agricultural College, Ames, Ia., November 15th, 1888.

Recent Publications.

Handbuch der Forstwissenschaft, in Verbindung mit A. Buhler, R. von Dombrowski, W. Exner, H. Fürst, u. s. w., herausgeben von Tuisko Lorey. In dreien theilen, in 8vo.; 630, 614, 576, ss. Tübingen, 1888.

Dr. Lorey, the learned professor in the University of Tübingen, has completed his work upon Forestry, which appears under the title which we have reproduced above. It occupies three stout volumes, and is rather an encyclopedia of forest science than a mere manual, in which different departments are fully treated by different specialists, among whom are found the names of some of the most distinguished professors in the German and Austrian forest schools. With them have been associated several practical forest experts in the preparation of this work, in which will be found a presentation of the different branches of science applicable to the management of the forest and of the methods of sylviculture adopted in the different countries of central Europe.

The first chapter, from the pen of Professor Weber, of Munich, is devoted to forest statistics; the distribution of forests in the different European countries, and an examination of the historical causes which have developed their actual present condition. To this Dr. Weber adds an exhaustive and most interesting account of the influence of the forest upon climates, the flow of rivers and the composition of soils.

The second chapter, by Dr. Lorey, is devoted to an examination of the question of instruction in forestry in the different countries of the world, including statistical information relating to schools of forestry and forest experimental stations, with the courses of study and the organization of all such establishments.

Professor Schwappach, of Tübingen, devotes the third chapter to a history of European forests and of European sylviculture, covering the period from the earliest days of modern civilization to the present time.

The fourth chapter is a treatise upon geology, mineralogy and chemistry, as applied to sylviculture, from the pen of Professor Ramann, of Eberswald.

The fifth chapter is devoted by Professor Luerssen to a forest flora, in which are described the ligneous plants native of Germany, together with such herbaceous plants as are met with in the forest and all the cryptogamic plants found growing upon trees in Germany, and often the cause of serious diseases among them.

Professor Lorey, in the sixth chapter, discusses exhaustively, methods of natural and artificial forest reproduction, to which is joined a study upon the creation of nurseries.

Fürst, Director of the Forest Institute of Aschaffenburg, treats in the seventh chapter those questions which relate to the injuries inflicted upon the forest by man and by the lesser animals, including insects, by parasitic vegetation, and by the fall of meteors. A second part of this same chapter is devoted by Förster, Chief Forester at Gmunden, to a discussion upon torrents and avalanches—that is to say, upon the art of mountain restoration as it is technically known.

Professor Exner, of Vienna, examines in an exhaustive manner in the eighth chapter the properties of different woods from a purely technical point of view—their color, grain, specific gravity, odor, density and elasticity. In the ninth chapter the head forester at Hildburghausen, Stötzer, discusses the uses to which different woods and barks are applied, methods of sale for forest products, the seasoning of timber, and of the harvesting and preservation of seeds. The second part of this chapter, by Professor Bühler, of Zurich, is devoted to a description of various forest products used in agriculture—forage, the bedding for domestic animals and manures. Professor Schuberz, of Carlsruhe, treats of the transportation of forest products; while the chemical composition of wood, its artificial preservation and the manufacture of paper-pulp, charcoal, wood-acid and resin, form the subject of a fourth division of this chapter, from the pen of Professor Schwackhofer, of Vienna.

Hunting and fishing and fish-culture occupy the ninth chapter.

Professor Lehr, of Munich, discusses in the tenth chapter capital and the formulas which must be followed in determining the relation of capital invested in forest property to its returns, relations which must be known in order that the most advantageous methods of forest management in different cases may be adopted. This is followed in the next chapter by an explanation by Professor Guttenberg, of Vienna, of the theory and practice of the measurements of the contents of timber in a forest, with tables showing the increase of different trees, both as solitary individuals and in masses.

The theory of forest management is developed by the director of the Forest Academy at Tharand, Professor Judeich, in the twelfth and most interesting chapter of the whole work, in which is explained broadly and clearly the principles upon which modern scientific forestry is based.

Professor Schwappach explains, in the thirteenth chapter, the organizations for the maintenance, in Germany, of forests belonging to the State, the Communes, and to individuals, while in the fourteenth and final chapter, Professor Lehr treats of the forest from the point of view of national defence and public wealth.

We have described at length the contents of this remarkable work, which is certainly the most comprehensive in scope and the richest in information that has yet appeared concerning the forest in its complex relations to modern society. In it are displayed very fully the actual condition of advanced knowledge in regard to the forests of Europe; and it stands as a worthy monument of the learning, industry and perseverance of the German officers who have made forest science what it is. The student of forests and forestry will find in it unlimited sources of information, but it is as an encyclopædia and not as a manual, as its title would seem to indicate, that Professor Lorey's great work must be considered, and like all encyclopædias, it loses something in the absence of unity of treatment and expression—an inevitable failing when a book is written by several authors working independently. But the book upon forestry is yet to be written, in which a master mind, having gathered all the facts which science has been accumulating during the past two centuries, exposes them in one compact, logical and well-balanced treatise.

Periodical Literature.

Attractive descriptions, profusely illustrated, of the environs of Vienna, are published in the October and November numbers of *Westermann's Monatsheften*. Vienna has grown with great rapidity during the past two decades, and the greatest intelligence has been displayed in laying out and planting the new quarters, and utilizing the possibilities which they offered for securing variety as well as beauty to the result. No finer streets exist than the encircling boulevards, laid out along the line of the old fortifications of the town, which are collectively known as the "Ringstrasse;" and in some of the suburbs villa-architecture, with all that it implies in the way of horticultural embellishment, has been brought to a very high degree of perfection.

In the *Atlantic Monthly* for October is a pleasant, poetical little pastoral in prose by Sophia Kirk called "Pasture Herb and Meadow Swath"—one of those witnesses to the development of love for nature and of the literary gift, to which we have referred more than once already as noteworthy proofs in the progress of American culture. In the "Contributor's Club," in the same magazine, is a brief but suggestive paper which enforces the fact that the more one knows the world the more pleasure it gives—that, in fact, we do not really enjoy it because we do not really even see it until we have learned for what and how to look. It is hardly needful to remind our readers that Mr. Burroughs has often preached from this important text; but too many teachers cannot join their voices with his in the effort to persuade people that the

study of natural science is far from being a dry pursuit, deadening to the æsthetic feelings—that it is, instead, a pursuit which, rightly followed, will deepen those feelings by giving them more and finer nourishment.

In the same magazine for November is an article, called "A November Chronicle," by a well-known naturalist, Mr. Bradford Torrey, which should be read by every one who fancies that summer must be really over because the almanac says it is. Who would believe, except upon evidence as good as Mr. Torrey's, that in the course of a Massachusetts November of average inclemency, seventy-three species of wild plants, representing twenty-two orders, were found in bloom? The list is given in full and is as varied as it is interesting. The great family of the *Compositæ* is most prominent with several species of Asters and Golden-rods, with Dandelions, Yarrow, Tansy, Cone-flower, Everlastings, Burdock and a number of others. But the Pea family is also well represented; the Pale Corydalis and even the Deptford Pink appear, while the Witch Hazel brings a single shrub in among the humbler plants. The places where most of the finds were made are described for the benefit of others who may wish to conduct autumn exploring expeditions, and also the relative profusion in which the various species appeared, some being very common, and others, of course, only isolated belated examples. Naturally the sea-shore proved the best hunting-ground. The list might have been increased, Mr. Torrey adds, had it been made to include garden-flowers, like the Pansy and the Larkspur, which he saw by the road-sides. But it was only of the veritable wild-flowers that he took account.

In the *Gentleman's Magazine* for November is an exhaustive, instructive and very interesting article called "Quinine and its Romance," by Mr. Alexander H. Japp. The title is not badly chosen, for the history of the Cinchona tree, as the source of one of the world's most valuable medicines, has certainly been a strange one. The precious powder was first brought to Europe in 1639 by the Countess of Chinchon, wife of a viceroy of Peru. Her name is, of course, the origin of the botanical name by which the great genus is now known, while quinine is derived from the native Peruvian term *quina*, and "Jesuit's bark" was long a familiar appellation, for the reason that the drug was long procured through the hands of Jesuit missionaries. It was a full century after the drug was known before the tree itself was discovered by a European —by Jussieu, in 1739. And then all the specimens which Jussieu sent home having perished, it was another century before growing trees were seen on European soil. These were specimens of *Cinchona Calisaya* grown in the Jardin des Plantes, at Paris, from seeds sent home in 1846 by Dr. Weddell. Attempts to cultivate Cinchona trees were made in 1852, in the Botanical Garden of Calcutta, but were unsuccessful, and the Indian government therefore sent the well-known botanist, Clement Markham, to South America in 1860, to seek for seeds of the various species and learn how they might best be grown. The history of the wanderings of Markham and his companions is one of the most interesting chapters in the history of botanical explorations. The many species of Cinchona trees are confined to the tropical regions of the Andes range, between about nineteen degrees south latitude and ten degrees north latitude, where they grow on the mountain slopes and in wild ravines, and their discovery was attended with the greatest hardships and dangers. But it is impossible here to do more than indicate the contents of Mr. Japp's paper, which, besides much historical information, gives, also, an account of the methods now employed in India, in growing Cinchona trees, in gathering the crop of bark and in preparing it for market.

A recent number of *Petermann's Mitteilungen* contains an interesting account by Baron Eggers, the well known explorer of the botany of St. Thomas, of a journey into the interior of San Domingo, illustrated by a large map of the districts traversed, from Puerto Plata on the northern coast southward to Santiago and La Vegas, and thence over the mountain-range south-eastward to Pico de Valle and south-westward to Maydama. Although the first part of the journey was along the chief route of communication between the seaport and the interior, the roads are so bad as to be passable only for packhorses even in the drier seasons, while in the rainy winter all communication is often suspended for weeks together.

The first Pines which he saw were at a height of 590 feet above the sea level, and on the crest of the El Puerto range, at a height of 1,700 feet, they formed a magnificent forest almost unmixed with other trees. The species is the same as that which occurs in Cuba—*Pinus occidentalis;* it extends up the slopes of the Sierra del Cibao to the summit—about 7,750 feet. Its range in altitude is, therefore, unusually great, although it seems to reach its greatest development at a height of about 4,600 feet. It is more particular, however, in regard to soil than climate, flourishing only where coarse chalk and red loam mingle in the subsoil. When these conditions are changed, the Pine disappears and deciduous trees take its place. As the undergrowth consists only of sparse shrubs, low-growing Ferns and Grasses, progress in the high mountain districts was found less difficult than in most other unexplored tropical regions. The chief obstruction came from frightfully heavy and prolonged thunder storms. In Jarabacoa, a village of 800 inhabitants, the church and the houses are built of small planks of *Oreodoxa oleracea* and thatched with the leaves of the same Palm. The inhabitants are chiefly occupied with Tobacco culture. In this neighborhood Baron Eggers found the so-called Nogal-tree (*Juglans Jamaicensis*). Further south and up to about 3,100 feet elevation the Pine woods contained a thick growth of *Davillia aculeata*, while the Manacle Palm (*Euterpe*) looked strangely side by side with Pines, and Bromeliads, with brilliant red leaves, grew upon the stems of the Conifers. In high districts, where the Oreodoxa does not grow, the houses are built of Euterpe planks and thatched with grass, no attempt being made to use the excellent wood of the Pines. The summits near Pico del Valle are covered in greater part with grass growing in thick bushy clumps, scattered through which are numberless small stones and some large rocks. Here and there are low thickets formed of shrub-like *Compositæ*, *Ericaceæ* and of *Garrya Fayeni*, while between the rocks grows a yellow-flowered species of *Scrophulariceæ*, a half-creeping Andromeda, and a multitude of plants which recall northern climates, such as Hieracium, Alchemilla, Galium, Chimaphila, Pteris, and, along the brooks, *Ranunculaceæ* and Carex. On the flints which are strewn about here and there, a small-leaved *Loranthus* with rosy flowers is conspicuous.

Few other botanical details are given in Baron Eggers' paper, which is rather a geographical than a botanical treatise. Nevertheless, it will interest all who care to learn about the general aspect and the local peculiarities of a little known country.

Recent Plant Portraits.

CÆSALPINIA JAPONICA, *Gardeners' Chronicle*, November 3d; a Japanese shrub, with yellow flowers, introduced by the Messrs. Veitch, and interesting as the only representative of a generally tropical genus, likely to be hardy in northern gardens.

ENKIANTHUS HIMALAICUS, *Revue Horticole*, November 16th; a representative of a small genus of plants of the Heath family, closely allied to Andromeda, and peculiar to the Himalaya, southern China and Japan.

The figure is from a plant which is described as hardy in the neighborhood of Paris, and which had been received from Japan, two facts which suggest the Japanese *E. Japonicus*, rather than *E. Himalaicus*, which is found in the hot and humid valleys of the Sikkim Himalaya.

ANGRÆCUM SANDERIANUM, *Revue Horticole*, November 16th; one of the most graceful and attractive of the small-flowered species of this genus, and a native of Madagascar.

TOXICOPHLÆA SPECTABILIS, *Revue Horticole*, November 16th; fruit.

VOCHYSIA GUATEMALENSIS, *Botanical Gazette*, xiii., *t.* 23.

PITCAIRNIA TUERCKHEIMEI, *Botanical Gazette*, xiii., *t.* 24.

CROCOSMA AUREA, var. MACULATA, *Gardeners' Chronicle*, November 17th; a variety of a well-known plant, with orange-colored flowers, the segments of the perianth marked with a purple-red spot, and declared "to be the finest form of the variable *Crocosma aurea* that has yet appeared." "It grows to a height of three to four feet, and single stems cut with their graceful leaves and placed in water, for in-door decoration, open their buds for weeks in succession."

MAXILLARIA FUSCATA, *Gardeners' Chronicle*, November 17th.

EUCALYPTUS VIMINALIS, *Gardeners' Chronicle*, November 24th; from a specimen grown on the Island of Arran, which has grown from the seed to a height of thirty feet since 1872.

CALANDRINIA OPPOSITIFOLIA, *Gardeners' Chronicle*, November 24th; a native of the coast mountains of northern California.

PINUS PINEA, *Gardeners' Chronicle*, November 24th; a portrait of the old species of the well known Italian Stone or Parasol Pine of Italy in Kew Gardens.

Notes.

During the year which ended on April 1st, 1888, the Government nurseries of Berlin distributed 105,778 young trees and shrubs, to be used in adorning the city and its suburbs, and 82,686 flowering and foliage plants. The nurseries which supply plants for the use of the city now contain nearly 4,000,000 specimens and are steadily being enlarged.

At a meeting of the New York Academy of Science held on December 3d, at Columbia College, Dr. H. N. Jarchow read a paper on the training of foresters in Europe, and the economic success that has been attained in forest culture there, and Professor E. B. Southwick, Secretary of the New York State Forestry Association, gave a brief history of what had been accomplished by that body.

Among the interesting plants detected by the Abbé Delavey in Yun-nan, and recently sent to France, there is a Fig (*Ficus Ti-Koua*), with edible fruits of the size and color of a Lady Apple, according to the *Revue Horticole*, which grow and ripen under ground. The plant is a shrub, with trailing, semi-subterranean branches, and large obovate-elliptical leaves. The Figs are called by the Chinese who eat them *Ti-Koua* or earth gourd.

A collector recently sent out by Dr. Dieck, a well-known German nurseryman and dendrologist, reports that the Rose hitherto sold in Europe as the true source of attar, and called "Rose de Kazanlik," is not to be found in the vicinity of Kazanlik at all. The true Roses for the production of attar, he says, are *Rosa alba suaveolens* and a variety of *Rosa Gallica*. Specimens of these plants he has been enabled to send to Germany, in spite of the strict laws which now prevail in the Danubian provinces against the exportation of attar-producing Roses.

It is well known that the slopes of Krakatoa, in the Strait of Sunda, and the regions around its base, were wholly desolated a few years ago by a terrible volcanic eruption, which covered them so deeply that all seeds as well as vegetable growths were destroyed. Almost immediately, however, it is said, Nature began to repair her ravages in a way that most interestingly illustrates her processes in early geological epochs. Fresh water Algæ soon covered the wide stretches of cinders and pumice-stone, forming a glutinous layer in which seeds could take root; and a couple of years after the eruption Ferns and Phanerogams had everywhere established themselves, the species being similar to those which take possession of newly formed coral islands.

An important horticultural exhibition will be held next year in Berlin, and will be open to all nations. The schedule of prizes contains 235 classes of stove or warm house-plants, 377 classes of green-house and hardy plants, besides classes for fruits, vegetables, nursery stock, tools and machines used in horticulture; and there will be a section in which the classes include the morphology, anatomy and growth of plants; physiology, useful and poisonous fungi; officinal and economic plants, plant geography, etc. The exhibition is expected to bring out the close relations which exist between architecture and horticulture. Visitors to Berlin, moreover, will have an opportunity to examine some of the finest examples of landscape gardening which can be seen now in Europe.

The attendance at the annual meeting of the American Forestry Congress, held at Atlanta last week, was unusually large, and the papers read and the discussions of topics presented were of the most instructive character. The officers elected for the year were: President, Governor J. A. Beaver, Pennsylvania; Vice-Presidents, H. G. Joly, Quebec; J. D. W. French, Boston; Charles Mohr, Mobile; Herbert Welsh, Philadelphia; George H. Parsons, Denver; Recording Secretary, N. H. Egleston, Washington; Treasurer, Charles C. Burney, Philadelphia. Mr. B. E. Fernow, Chief of the Forestry Division of the Department of Agriculture, was compelled to decline the office of Corresponding Secretary, which he has most acceptably filled since the organization of the Congress, and J. B. Harrison, of New Hampshire, was chosen as his successor.

Mr. Meehan tells the readers of the *Country Gentleman* that in an old Indian village of Alaska, the people used to carve their genealogies on huge poles before their doors, by means of hieroglyphics. One generation cut its crow or its bear, or whatever the tribal style may be, on it; and so on, one above another, generation by generation, to the top. They do not do it now, but the moss-grown and neglected old poles, some two feet thick and perhaps twenty feet high, are still standing. On the tops of these poles, Hemlock and Spruce trees have sprouted and grown; great bushy trees, ten or fifteen feet high, and as handsome as any seen in a nursery. In some cases the roots have gone down through the old poles, twenty feet or more, to the ground, splitting the poles open and exposing the roots, which perhaps will be, when the old poles rot away, real trunks to support the trees.

It is said that American competition has greatly interfered of late years with the resin industry of the districts of the Gironde in France, at one time the chief support of a large portion of the inhabitants. About a third part of the land in the department once consisted of barren sandy wastes called *Landes* upon which nothing but Pines would grow. *Pinus maritima* was planted in large quantities, and despite the recent falling off of the trade in resin, it still affords many sources of revenue, the most important of which is the furnishing of pit-props for use in the English mining districts. One hundred and seventy-five thousand tons of these props are annually exported. Young trees are also sent to England in large quantities to be employed in paper making; railway sleepers and telegraph poles are supplied for many parts of France, and an illuminating oil is made from the resin, which readily finds local buyers, as it burns well, is even cheaper than kerosene, and, moreover, is non-explosive.

According to a correspondent of *The American Architect and Building News*, seven crops of forage are annually gathered from the plains of Lombardy. The district is naturally well watered, the great reservoir of the Alps being near at hand and a number of rivers traversing it on their way towards the Po. But a natural supply of water would not suffice, during the long, hot summer of Italy, to preserve the plain in such a phenomenal state of fertility. A vast expenditure of labor and skill has for ages been devoted to works of irrigation. At least as early as the twelfth century they were well under way, under the direction of the monks in a branch house of the monastery of Clairvaux, which had been established by St. Bernard near Milan. During Renaissance times they were carried on by some of the greatest architects of Italy, Leonardo da Vinci, for example, having conceived the idea of connecting the Mincio and the Tessina by means of a canal. And to-day the whole plain is a net-work of canals and reservoirs which cannot be exhausted by the fiercest drought.

Among recent devices for preserving timber is that advocated by Filsinger, who recommends impregnating the wood with a weak solution of aluminium chloride. Another suggestion is, that a solution of gutta-percha, obtained by a mixture of two-thirds gutta-percha and one-third paraffine heated together until the gum melts, shall be forced into the cells of timber from which the air has been previously exhausted. The gutta-percha, as it cools, hardens and completely fills the cells. But the latest suggestion is that of Von Berkel, who proposes first to impregnate wood with a saturated solution of lime water or milk of lime. The board is then dried and placed in a vacuum cylinder and impregnated with a mixture of silicic acid and mineral oil or some other fatty or bituminous substance, by pressure applied for a considerable time, when a process of petrifaction takes place and a kind of asphalt rock is formed within the wood cells. The industrial value of this invention has not been demonstrated yet, although the possibility of using water gas for these purposes, of which Von Berkel's plan appears to be only a modification, has long been recognized.

There seems to be no end in England to the making of horticultural societies. The attention which the English give to minor branches of the art is shown by the flourishing existence of a National Auricula Society and a National Carnation and Picotee Society, both of which hold well-attended annual meetings and large exhibitions. Speaking of the Auricula, *The Garden* recently quoted from a book published in 1764 to prove that even at this time this flower was high in public favor. Indeed, the author of the book in question said of the Auricula that it was "formerly the pride of English gardeners and florists," whose success in raising new seedling varieties greatly excited the envy of their Dutch rivals. But there could have been nothing to complain of in his own time, for he declared that he had known good new seedling Auriculas to sell for seventy guineas apiece. As *The Garden* remarks, "When we consider the value of money in those days as compared with the present, this does seem an enormous sum, for there could have been no gambling with so perishable a plant as there was with the Tulip in the days of the Tulip mania in Holland." A single guinea is now considered a very high price for a new Auricula in England.